Draft
Archaeological Inventory Survey for the Airport Section (Construction Section 3) of the Honolulu High-Capacity Transit Corridor Project, Hālawa and Moanalua Ahupua‘a, ‘Ewa and Honolulu Districts, O‘ahu Island TMK Sections [1] 1-1 and 9-9 (Various Plats and Parcels)

Prepared for

The City and County of Honolulu

and

The Federal Transit Administration

On Behalf of

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Management Summary

Reference	Archaeological Inventory Survey for the Airport Section (Construction Section 3) of the Honolulu High-Capacity Transit Corridor Project, Hālawa and Moanalua Ahupua‘a, ‘Ewa and Honolulu Districts, O‘ahu Island TMK Sections [1] 1-1 and 9-9 (Hammatt et al. 2013)
Date	March 2013
Project Number (s)	Cultural Surveys Hawai‘i, Inc. (CSH) Job Code: HALAWA 13
Investigation Permit Number	The field work for this archaeological inventory survey (AIS) was carried out under archaeological permit number 12-04 issued by the Hawai‘i State Historic Preservation Division/ Department of Land and Natural Resources (SHPD/DLNR) per Hawaii Administrative Rules (HAR) Chapter 13-282.
Project Location and AIS Study Area	The Honolulu High-Capacity Transit Corridor Project (HHCTCP) extends approximately 37.0 kilometers (23 miles) from Kapolei in the west to the Ala Moana Center in the east. The project was divided into four construction sections, with Section 1 towards Kapolei and Section 4 towards Ala Moana. The study area for this AIS is most of the third and a small portion of the fourth construction sections, extending from Kamehameha Highway at Kalaloa Drive (just northwest of Hālawa Stream) in the west to Kamehameha Highway at Middle Street (just west of Kalihi Stream) in the east. The AIS for Section 2 (reviewed and accepted by the SHPD Section 106 review of May 23, 2012, Log No. 2012.1449, Doc No. 1205NN23) by general agreement extended slightly east of the construction section terminus at Aloha Stadium (to Hālawa Stream). Similarly, the AIS for construction Section 4 (presently in preparation), by general agreement extends slightly west from the western terminus of construction Section 4 in the vicinity of the Middle Street Transit Center (by Kalihi Stream).
Land Jurisdiction	Federal, State, City, and Private. Federal lands bounded by Radford Drive, Tarawa Drive, and Kamehameha Highway are proposed for the Pearl Harbor Naval Base Station. State lands include portions of the corridor along Kamehameha Highway, North Nimitz Highway, the H-1 Freeway, Aolele Street, and the Honolulu International Airport. City lands include portions of the corridor along Ualena Street and Waiwai Loop. Private lands (privately owned at the present time) are understood to include: Harry B. Kronick Trust lands near Kamehameha Highway and Kalaoa Street and private holdings on Waiwai Loop including lands of the John V. Brewer Trust, Chevron USA Inc., International Express, Inc, Queen Bee Limited Partnership, Waiwai Loop Rental Inc., Window World Inc., Watumull Enterprises Ltd., Alert Holdings Group, Inc., and 2676 Waiwai Loop LLC.

Agencies	City and County of Honolulu (City), SHPD/DLNR, Federal Transit Administration (FTA), U.S. Navy, and the Hawaii State Department of Transportation (Airport Division)
Funding	FTA, City
Area of Potential Effect (APE) and AIS Study Area Acreage	The HHCTCP APE for archaeological cultural resources is defined in the HHCTCP final Programmatic Agreement (PA) (Stipulation II.A.1) as all areas of direct ground disturbance. The Airport AIS study area includes all of the HHCTCP APE between Station 994+00 and Station 1248+00, for a distance of 7.74 kilometers (25,400 feet or 4.8 miles). Project engineers estimate that the area of direct ground disturbance for the Airport Section will be approximately 3.67 ha (9.06 acres or 394,504 square feet) including the three stations.
Historic Preservation Regulatory Context	Due to federal (FTA) funding, and use of federal U.S. Navy lands, this project is a federal undertaking, requiring compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and Section 4(f) of the Department of Transportation Act. Through the Section 106 historic preservation review process, the project's lead federal agency, FTA, has determined that the project will have an adverse effect on historic properties currently listed, or eligible for listing, on the National Register of Historic Places (NRHP). The Hawaii State Historic Preservation Officer (SHPO) concurred with this undertaking effect determination. To mitigate the undertaking's potential adverse effect, a PA was executed January 18th, 2011, with FTA, Hawaii SHPO, the United States Navy, the Advisory Council on Historic Preservation as signatories, and the City as an invited signatory. PA Stipulation III requires that an archaeological inventory survey plan (AISP) be prepared and approved by the SHPD for each of the four HHCTCP construction sections. An AISP for the Airport Section (Hammatt and Shideler 2011) was prepared to fulfill PA Stipulation III and was accepted in the SHPD Section 106 review letter of December 2, 2011 (Log No. 2011.2167, Doc No 1211NN01). The AISP defines the scope of work and details the proposed methods and sampling strategy for this AIS, in accordance with the requirements for an AISP stated in HAR Chapter 13-275-5(c). Subsequently consideration was given to a possible alternate site (Alternate A) for the Honolulu International Airport station located approximately 60 m south (*makai*) of the Honolulu International Airport station location addressed in the Hammatt and Shideler (2011) AISP. This possible alternate station site was addressed in an Addendum AISP (Hammatt and Shideler 2013). The Addendum AISP was accepted in the SHPD Section 106 review letter of March 1, 2013 (Log No. 2013.1957, Doc. No. 1302SL29).

	Following the approved AISP (Hammatt and Shideler 2011) as amended in an AISP Addendum (Hammatt and Shideler 2013) the Airport AIS investigation was carried out. This report was prepared in consideration of the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* and to support the project's PA and Section 106 compliance. This AIS investigation also supports the project's historic preservation review under Hawai‘i Revised Statutes (HRS) Chapter 6E-8 and Hawai‘i Administrative Rules (HAR) Chapter 13-275 governing procedures for historic preservation review for governmental projects, and Chapter 13-276 governing standards for Archaeological Inventory Surveys and Reports. Any Native Hawaiian human remains, funerary objects, sacred objects, or objects of cultural patrimony discovered on federal lands (there were no such finds) would have required compliance with the Native American Graves Protection and Repatriation Act (43 CFR Part 10). Human skeletal remains and associated objects found on non-federal lands (there were no such finds) would have been treated in accordance with HRS Chapter 6E-43 and HAR Chapter 13-300. A *Consultation Protocol for Iwi Kūpuna Discovery*.. (Hammatt 2011) (reviewed and approved by FTA, per the project PA) was developed to address any identifications of human skeletal remains. In addition, identification and National/Hawai‘i Register eligibility recommendations for the project area's architectural cultural resources, including historic roads, bridges, and structures, was conducted by historic architectural firm Mason Architects, Inc., in association with the project's Final Environmental Impact Statement (FEIS) (USDOT/FTA and C&C/DTS 2010).
Document Purpose	This AIS investigation was conducted to identify, document, and make National Register of Historic Places (National Register) and Hawai‘i Register of Historic Places (Hawai‘i Register) eligibility recommendations for the study area's archaeological cultural resources[1]. In consultation with the SHPD, this investigation was also designed to fulfill the State requirements for an AIS per Hawai‘i Administrative Rules (HAR) Chapter 13-13-276. The investigation includes an undertaking-specific effect recommendation and treatment/mitigation recommendations for the identified archaeological cultural resources recommended National/Hawai‘i Register eligible. This document is intended to support project-related historic preservation consultation among stake-holding federal and state agencies, interested Native Hawaiian groups and individuals, and community groups.
Summary of Fieldwork Effort	Forty (40) test excavations were proposed within the AISP, but a total of 47 test excavations were in fact completed (18 % more than specified in the AISP carried out in conformity to the Addendum AISP). The additional seven test excavations addressed a relocation of the proposed

	Honolulu International Airport Station footprint. Fieldwork was carried out under the supervision of Matt McDermott, M.A. (principal investigator), between March 29 2012 and October 2 2012. Field staff included 21 CSH archaeologists: Jennifer Bellville, Kelly Burke, Rebecca Choi, Ellen DeLeeuw, Brittany Enanoria, Randy Groza, Nigel Kingsbury, Nifae (Mana) Hunkin, Andrea Kay, Fred LaChance, Kimi Matsumoto, Leandra Medina, Abbey Mierzejewski, Michelle Pammer, Michael (Pablo) Rivera, Andrew Soltz, Ena Sroat, Tyler Turan, Todd Tulchin, Josephine Yucha, and Trevor Yucha. Fieldwork required 1,120 person-hours or 140 person-days to complete.
Cultural Resources[1]/Historic Properties[2] Identified and Recommended Eligibility to the National/Hawai‘i Registers[3]	SIHP 50-80-13-7420 archaeological cultural resource, sections of buried asphalt road way, likely associated with an early alignment of Kamehameha Highway and other mid-twentieth century roads, recommended National/Hawai‘i Register-eligible under Criterion D. SIHP 50-80-13-7421 archaeological cultural resource, buried concrete slabs and a prepared coral paving surface believed to be remnants of warehouses and infrastructure erected by the military in 1942/1943, recommended National/Hawai‘i Register-eligible under Criterion D.
Effect Recommendation	As noted above, through the project’s Federal Section 106 historic preservation review process the project has already been determined to have an “adverse effect” on historic properties. The AIS investigation results are in keeping with this federal effect determination because Construction Section 3 will adversely affect portions of SIHP 50-80-13-7420 and SIHP 50-80-13-7421. Under Hawaii State historic preservation review legislation, CSH’s project-specific effect recommendation is “effect, with proposed mitigation commitments.” The recommended mitigation measure for the Construction Section 3 AIS will reduce the project’s effect on the identified archaeological cultural resources, SIHP 50-80-13-7420 and SIHP 50-80-13-7421.
Mitigation[4] Recommendations	Based on the results of this AIS investigation, a combination of on-call and full-time/on-site, archaeological monitoring is recommended as an appropriate archaeological mitigation measure during the Construction Section 3 construction. Based on AIS results and background research, on-site archaeological monitoring program is recommended: 1) near the banks of Hālawa Stream, 2) in the area of the natural sediments on the west edge of the former west entrance to Ke‘ehi Lagoon, (the area from Lagoon Drive Station extending 300 m east) and 3) for the locations of identified archaeological resources SIHP 50-80-13-7420 and SIHP 50-80-13-7421. The specifics of the archaeological monitoring program are to be codified in an archaeological monitoring plan for the review and approval of the SHPD prior to construction work in the vicinity.

[1]In historic preservation parlance, cultural resources are the physical remains and/or geographic locations that reflect the activity, heritage, and/or beliefs of ethnic groups, local communities, states, and/or nations. Generally, they are at least 50 years old, although there are exceptions, and include: buildings and structures; groupings of buildings or structures (historic

districts); certain objects; archaeological artifacts, features, sites, and/or deposits; groupings of archaeological sites (archaeological districts); and, in some instances, natural landscape features and/or geographic locations of cultural significance.

[2] Historic properties, as defined in 36 CFR 800.16, are any prehistoric or historic districts, sites, buildings, structures, or objects included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This includes artifacts, records, and remains that are related to and located within such properties, as well as properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. Determinations of eligibility are generally made by a federal agency official in consultation with the SHPO. Under federal legislation, a project's (undertaking's) potential effect on historic properties must be evaluated and potentially mitigated. Under Hawai‘i State historic preservation legislation, historic properties are defined as any cultural resources that are 50 years old, regardless of their historic/cultural significance under state law, and a project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties determined eligible, based on their integrity and historic/cultural significance in terms of established significance criteria, for inclusion in the Hawai‘i Register of Historic Places). Determinations of eligibility to the Hawai‘i Register result when a state agency official's historic property "significance assessment" is approved by SHPD, or when SHPD itself makes an eligibility determination for a historic property.

[3]Cultural resource significance is evaluated and expressed as eligibility for listing on the National and/or Hawai‘i Register of Historic Places. To be considered eligible for listing on the National and/or Hawai‘i Register a cultural resource should possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet one or more of the following broad cultural/historic significance criteria: "A" reflects major trends or events in the history of the state or nation; "B" is associated with the lives of persons significant in our past; "C" is an excellent example of a site type/work of a master; "D" has yielded or may be likely to yield information important in prehistory or history; and, "E" (Hawai‘i Register only) has traditional cultural significance to an ethnic group, includes religious structures and/or burials.

[4]Under Hawai‘i State historic preservation review legislation, there are five potential forms of historic preservation mitigation: A) Preservation; B) Architectural Recordation; C) Archaeological Data Recovery (which includes archaeological monitoring); D) Historical Data Recovery; and E) Ethnographic Documentation (HAR Chapter 13-275-8).

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Section 1 Introduction

1.1 Project Background

Cultural Surveys Hawai‘i, Inc. (CSH) completed this archaeological inventory survey (AIS) for Construction Section 3 (Airport) of the Honolulu High-Capacity Transit Corridor Project (HHCTCP) for the Honolulu Authority for Rapid Transit (HART) of the City & County of Honolulu (City), for the Federal Transit Administration (FTA), and on behalf of PB Americas, Inc. (PB). The AIS Airport study area is from Kalaloa Drive (just northwest of Hālawa Stream) in the west to Middle Street (just west of Kalihi Stream) in the east, located within the traditional Hawaiian land divisions of Hālawa (‘Ewa District) and Moanalua Ahupua‘a (Honolulu District), Island of O‘ahu, TMK: [1] 1-1 and 1-9 (Various Plats and Parcels).

The entire HHCTCP extends approximately 37 km (23 miles) from Kapolei in the west to the Ala Moana Center in the east. The focus of this AIS is the majority of the Airport Section 3 construction section, which extends from Station 994+00 Kamehameha Highway at Kalaloa Drive (just northwest of Hālawa Stream) to Station 1248+00 (Kamehameha Highway at Middle Street, just west of Kalihi Stream), for a distance of 7.74 kilometers (25,400 feet or 4.8 miles) and includes three stations: the Pearl Harbor Naval Base Station, the Honolulu International Airport Station, and the Lagoon Drive Station and a “System Site” transit facility 250 m east of the Lagoon Drive Station.

The portion of the HHCTCP route addressed in this archaeological inventory survey investigation has a western end on Kamehameha Highway at Kalaloa Drive, 100 m northwest of Hālawa Stream (where it meets the southeast end of the Phase 2 AIS study area). The route continues south on Kamehameha Highway. Just south of Radford Drive is the Pearl Harbor Naval Base Station platform extending over Kamehameha Highway, with an associated transit station on the ground level on the southeast corner of Radford Drive and Kamehameha Highway. From the Pearl Harbor Naval Base Station, the route continues south on Kamehameha Highway, passing over the Center Drive intersection, where it continues south following the alignment of the H-1 Freeway Viaduct Makai Frontage Road (on the makai side of the H-1 Freeway Viaduct), crossing to the *makai* (seaward) side of Nimitz Highway by Valkenburgh Street. The route continues southeast on the *makai* side of Nimitz and the H-1 Freeway Viaduct, passing Main Street and Elliott Street. At Aolele Street the route turns south (*makai*), continuing along the east side of the *mauka/makai* (inland/seaward) trending Aolele Street, curving east at Ala Onaona Street, to the Honolulu International Airport Station. The two alternate Honolulu International Airport Station locations are located (in a presently at-grade parking area) just northwest of the main Honolulu Airport overseas parking structure. From that station, the route continues east following the alignment of Ala Onaona Street, crossing Pai‘ea Street. Past Aowena Place, the route angles *mauka* to cross from Aolele Street to Ualena Street. The route then follows Ualena Street, crossing Lagoon Drive. The Lagoon Drive Station is immediately east of Lagoon Drive on the south portion of Waiwai Loop (*mauka* and *makai* entrance buildings are on either side of this portion of Waiwai Loop). From that station, the route continues east on the south side of the south portion of Waiwai Loop, crossing over an area of warehouses to Ke‘ehi Lagoon Beach Park. The route angles northeast through Ke‘ehi Lagoon Beach Park, *makai* of the tennis courts, and crosses Moanalua Stream *makai* and parallel to Nimitz Highway. In the short stretch

between Moanalua Stream and Kalihi Stream, the route crosses *mauka* of Nimitz Highway, joining Kamehameha Highway at the Middle Street intersection (where it meets the Section 4 AIS study area).

This Airport AIS study area includes the majority of HHCTCP's Construction Section 3, but it is truncated slightly at both ends (the AIS study addressing the west end has been accepted by the Hawai‘i State Historic Preservation Division (SHPD) and the AIS study of the east end is on-going). The Airport AIS study area is depicted on a U.S. Geological Survey 7.5-Minute Series Topographic Map, Honolulu (1998) Quadrangle (Figure 1), on the two applicable Tax Map Key (TMK) section maps (Figure 2 and Figure 3) and an aerial photograph (Figure 4).

The AIS Section 3 Airport study area is primarily located within existing road rights-of-way owned by the State of Hawai‘i or the City, including Kamehameha Highway, North Nimitz Highway, Aolele Street, and Ualena Street to the vicinity of Lagoon Drive, then back to Nimitz Highway, then turning to Kamehameha Highway just west of Kalihi Stream. Support facilities along the project corridor are located on adjacent privately owned lands.

The HHCTCP's purpose is to provide high-capacity rapid transit in the highly congested east-west transportation corridor between Kapolei and the Ala Moana Center via a fixed guideway rail transit system. The FTA and the City will fund project construction. In addition to the guideway, the project will require construction of transit stations and ancillary support facilities. Three transit stations are within the current AIS study area, including: Pearl Harbor Naval Base Station, Honolulu International Airport Station, and the Lagoon Drive Station (see Figure 1 to Figure 4). Project construction will also require relocation of existing utility lines within the project corridor that conflict with the project design. Minimally, land-disturbing activities will include grading of facility locations and excavations for guideway column foundations, subsurface utility relocation and installation, and station and ancillary facility foundation construction.

1.2 Historic Preservation Regulatory Context

Due to federal (FTA) funding, and use of federal U.S. Navy lands, this project is a federal undertaking as defined in 36 CFR 800.16, requiring compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and Section 4(f) of the Department of Transportation Act. Through the Section 106 historic preservation review process, the project's lead federal agency, FTA, has determined that the project will have an adverse effect on historic properties currently listed, or eligible for listing, on the National Register of Historic Places (NRHP). The Hawaii State Historic Preservation Officer (SHPO) concurred with this undertaking effect determination.

To alleviate the undertaking's potential adverse effect, a Programmatic Agreement (PA) was executed January 18th, 2011, with FTA, Hawaii SHPO, the United States Navy, and the Advisory Council on Historic Preservation as signatories. PA Stipulation III requires that an archaeological inventory survey plan (AISP) be prepared and approved by the SHPD for each of the four HHCTCP construction sections.

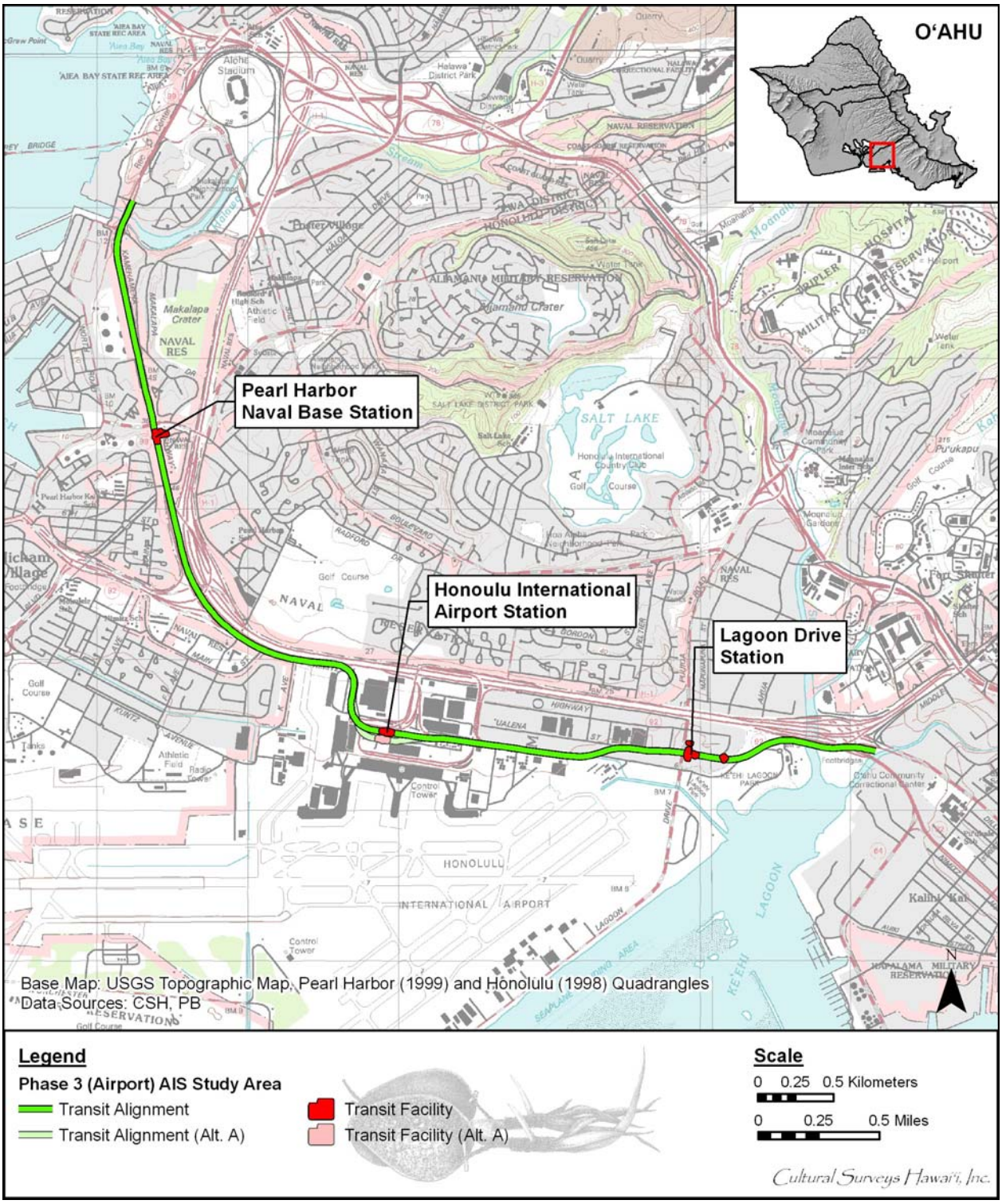

Figure 1. Airport Section 3 (and alternate alignment at Honolulu International Airport Station) AIS study area shown on U.S. Geological Survey 7.5-minute Series topographic maps, Pearl Harbor (1999) and Honolulu (1998) quadrangles (U.S. Geological Survey)

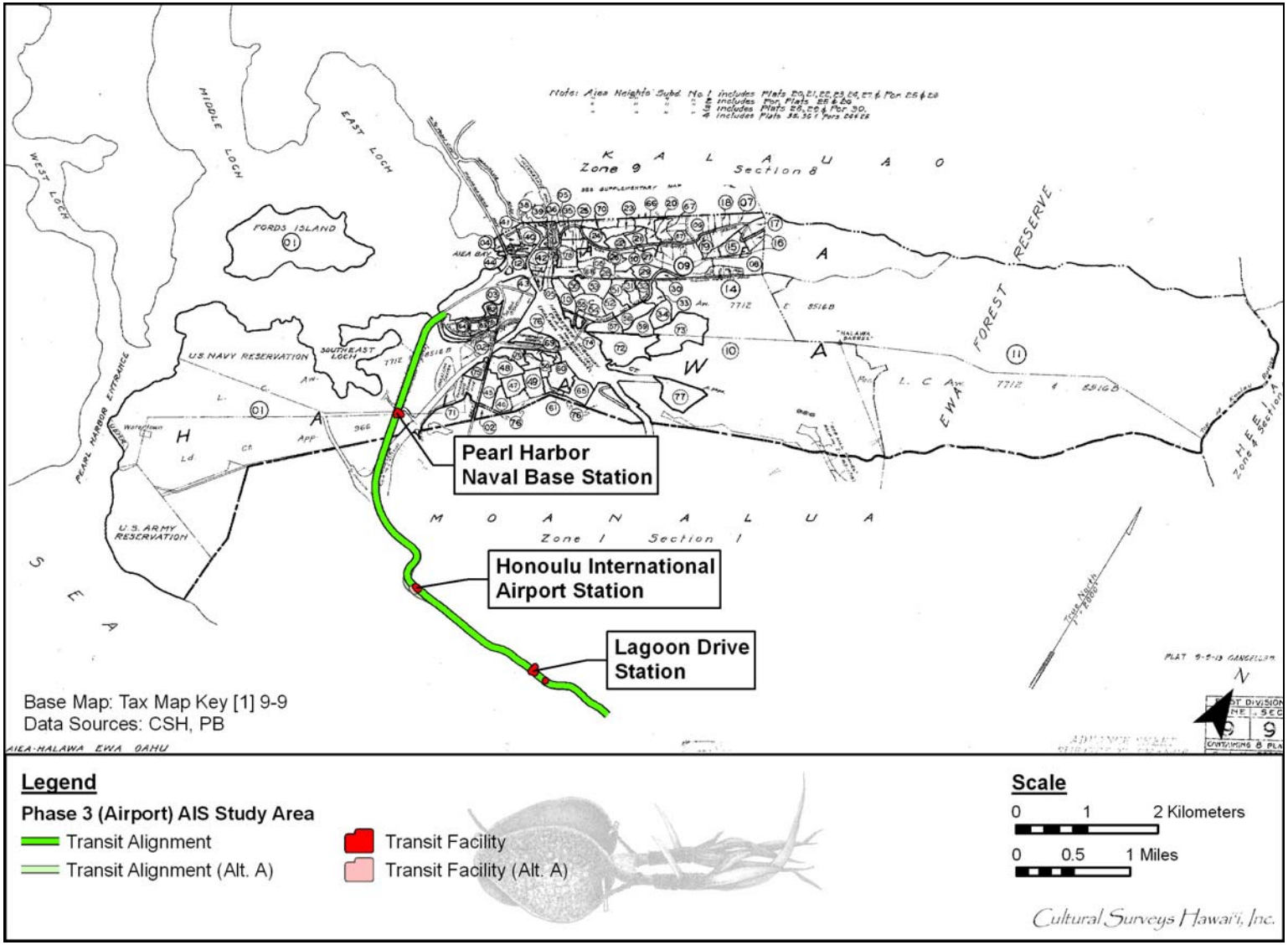

Figure 2. Tax Map Key (TMK) Section map [1] 9-9 showing western portion of Airport Section AIS study area

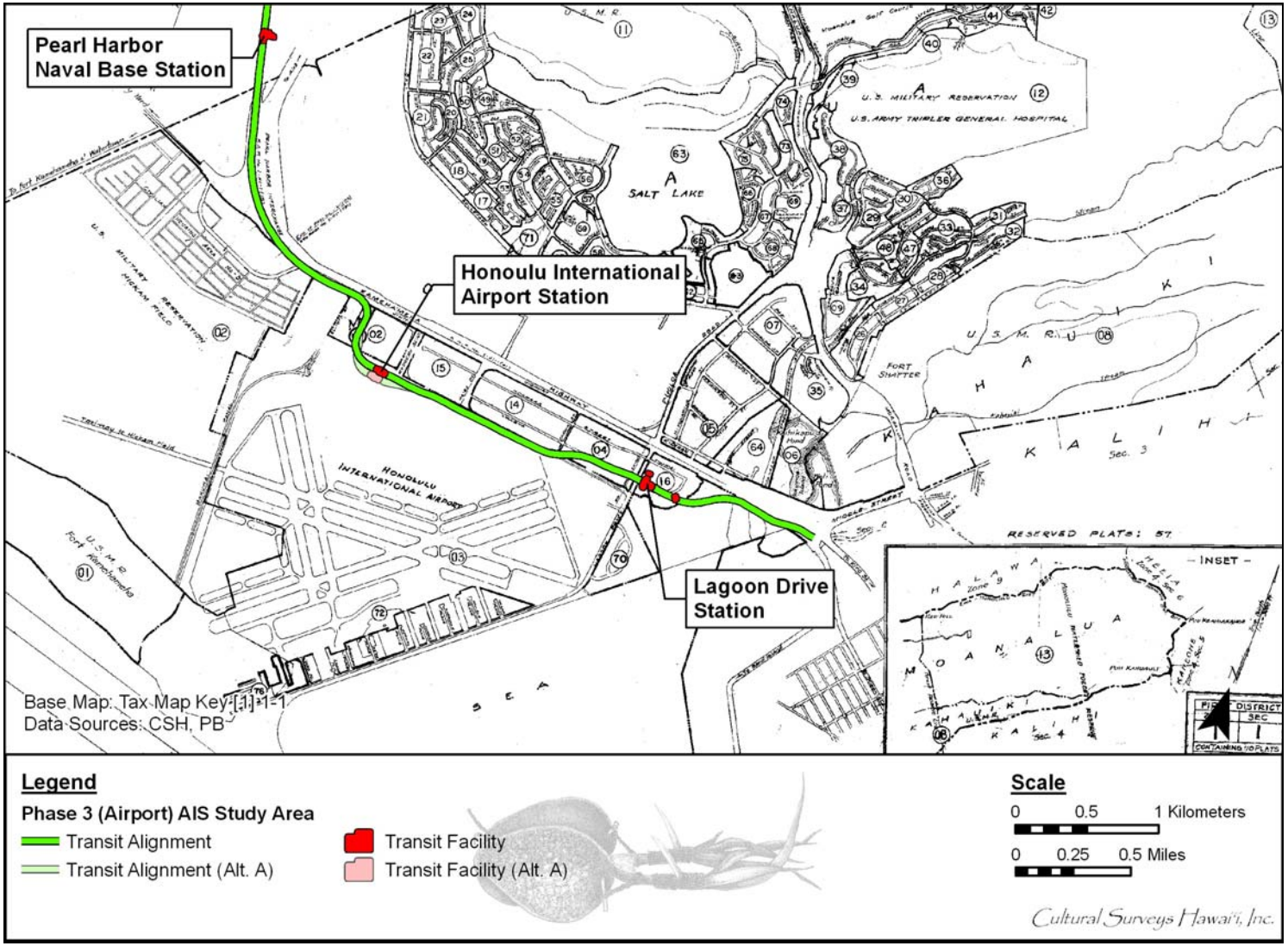

Figure 3. Tax Map Key (TMK) Section map [1] 1-1 showing eastern portion of Airport Section (and alternate alignment at Honolulu International Airport Station) AIS study area

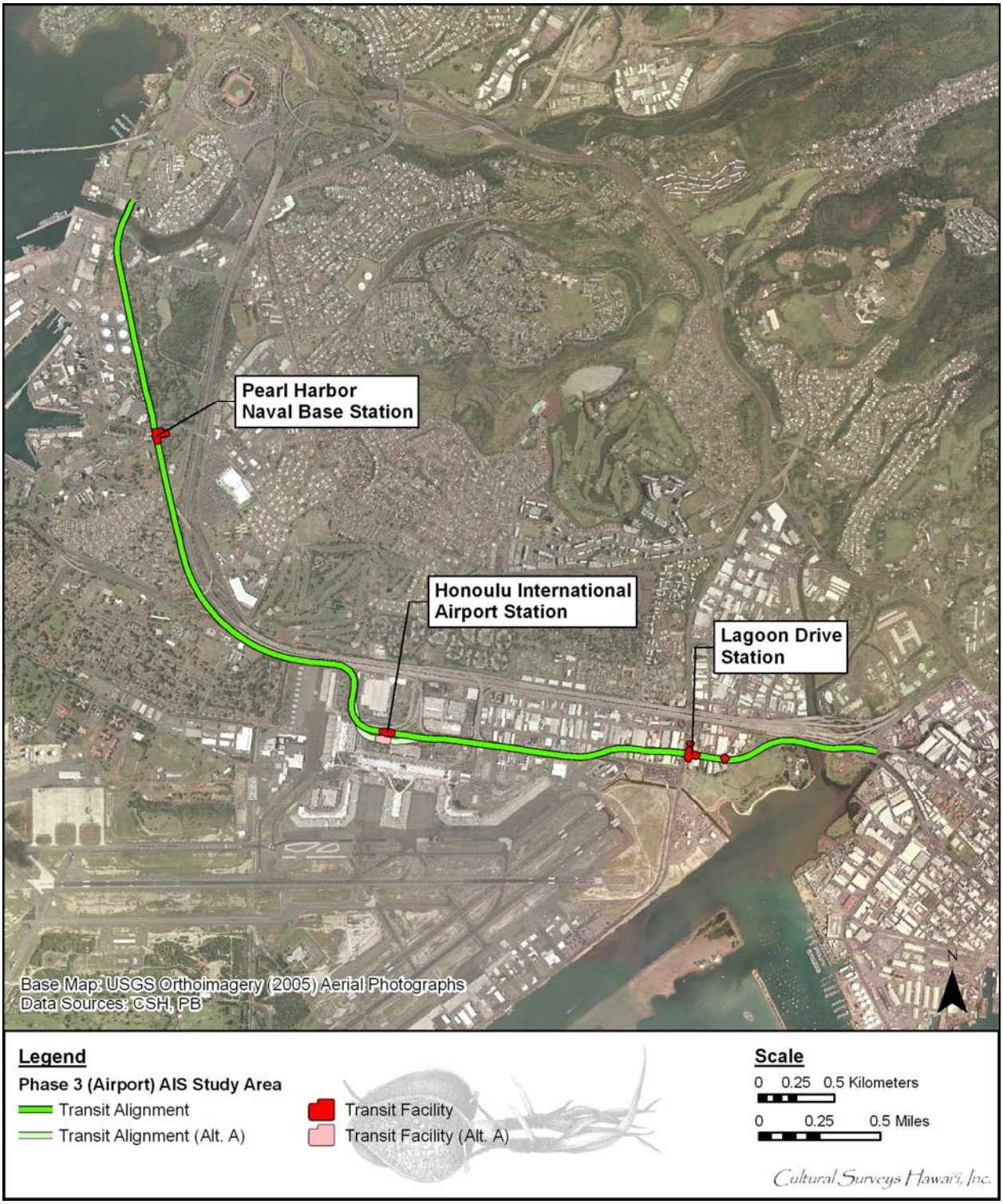

Figure 4. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) of the Airport Section (and alternate alignment at Honolulu International Airport Station) AIS study area

An AISP for the Airport Section (Hammatt and Shideler 2011) was prepared to fulfill PA Stipulation III and was accepted in the SHPD Section 106 review letter of December 2, 2011 (Log No. 2011.2167, Doc No 1211NN01). The AISP defines the scope of work and details the proposed methods and sampling strategy for this AIS, in accordance with the requirements for an AISP stated in Hawai‘i Administrative Rules (HAR) Chapter 13-275-5(c). Subsequently consideration was given to a possible alternate site (Alternate A) for the Honolulu International Airport station located approximately 60 m south (makai) of the Honolulu International Airport station location addressed in the Hammatt and Shideler (2011) AISP. This possible alternate station site has been addressed in an Addendum AISP (Hammatt and Shideler 2013) that was accepted in the SHPD Section 106 review letter of March 1, 2013 (Log No. 2013.1957, Doc. No. 1302SL29) submitted to the SHPD for their review and approval.

Following the approved AISP (Hammatt and Shideler 2011) the Airport AIS investigation was carried out. This report was prepared in consideration of the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* and to support the project's PA and Section 106 compliance. This AIS investigation has also been prepared to support the project's historic preservation review under Hawai‘i Revised Statutes (HRS) Chapter 6E-8 and HAR Chapter 13-275 governing procedures for historic preservation review for governmental projects, and Chapter 13-276 governing standards for Archaeological Inventory Surveys and Reports. This AIS is prepared for the review and concurrence of the Hawaii SHPO/SHPD.

Any Native Hawaiian human remains, funerary objects, sacred objects, or objects of cultural patrimony discovered on federal lands (there were no such finds) would have required compliance with the Native American Graves Protection and Repatriation Act (43 CFR Part 10). Human skeletal remains and associated objects found on non-federal lands (there were no such finds) would have been treated in accordance with HRS Chapter 6E-43 and HAR Chapter 13-300.

An AIS of HHCTCP Construction Section 1 (extending east from the East Kapolei Station to the Pearl Highlands Station), was completed by CSH in February 2010 and reviewed and approved by SHPD on April 19th, 2010 (SHPD correspondence LOG NO: 2010.1749 / DOC NO: 1004MV01).

An AIS of HHCTCP Construction Section 2 (extending east from Waimano Home Road to Kalaloa Street, just west of Hālawa Stream) was completed by CSH in May 2012 and reviewed and approved in the SHPD Section 106 review of May 23, 2012 (Log No. 2012.1449, Doc No. 1205NN23).

An AISP for HHCTCP Construction Section 4 was accepted in a SHPD Section 106 review dated October 25, 2011 (Log No 2011.2379, Doc No. 1110NN08). At the time of writing (February 2013) the AIS report for Section 4 is in preparation.

The AIS for Section 2 that was reviewed and accepted by the SHPD Section 106 review of May 23, 2012 (Log No. 2012.1449, Doc No. 1205NN23) by general agreement, extended slightly east of the construction section terminus at Aloha Stadium (to Hālawa Stream). Similarly, the AIS for construction Section 4 (presently in preparation), by general agreement extends slightly west from the western terminus of construction Section 4 in the vicinity of the Middle Street Transit Center (to the east bank of Kalihi Stream).

The HHCTCP area of potential effect (APE) for archaeological cultural resources is defined in the HHCTCP final PA (Stipulation II.A.1.) as all areas of direct ground disturbance. For the present Airport AISP survey area (most of Construction Section 3), HHCTCP engineers estimate that the project's area of direct ground disturbance is approximately 3.67 ha (9.06 acres or 394,504 square feet). These 3.67 ha are the survey area for this Section 3 Airport AIS investigation.

Identification and National/Hawai‘i Register eligibility recommendations for the project area's architectural cultural resources, including historic roads, bridges, and structures, were conducted by historic architectural firm Mason Architects, Inc., in association with the project's Final Environmental Impact Statement (FEIS) (USDOT/FTA and C&C/DTS 2010).

Generally, under both Hawai‘i State and federal historic preservation legislation, archaeological inventory surveys are designed to identify, document, and collect enough data to evaluate the significance of potential "historic properties." As discussed in the paragraphs below, there are important distinctions between the Federal and Hawai‘i State definitions of "historic property." To alleviate any confusion these different definitions might cause, CSH has opted in this document to use the more generic term "cultural resources" and as defined below, in its discussion of the cultural remains within the current study area. The use of the term cultural resources in these instances is common practice in cultural resource management and is in keeping with the historic preservation requirements/definitions of both 36 CFR 800 and HAR Chapter 13-275.

In historic preservation parlance, cultural resources are the physical remains and/or geographic locations that reflect the activity, heritage, and/or beliefs of ethnic groups, local communities, states, and/or nations. Generally, they are at least 50 years old, although there are exceptions, and include: buildings and structures; groupings of buildings or structures (historic districts); certain objects; archaeological artifacts, features, sites, and/or deposits; groupings of archaeological sites (archaeological districts); and, in some instances, natural landscape features and/or geographic locations of cultural significance.

Historic properties, as defined in 36 CFR 800.16, are any prehistoric or historic districts, sites, buildings, structures, or objects included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. This includes artifacts, records, and remains that are related to and located within such properties, as well as properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. Determinations of eligibility are generally made by a federal agency official in consultation with the SHPO. Under federal legislation, a project's (undertaking's) potential effect on historic properties must be evaluated and potentially mitigated.

Under Hawai‘i State historic preservation legislation, historic properties are defined as any cultural resources that are 50 years old, regardless of their significance under state law, and a project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties determined eligible, based on established significance criteria, for inclusion in the Hawai‘i Register). Determinations of eligibility to the Hawai‘i Register result when a state agency official's historic property "significance assessment" is approved by SHPD, or when SHPD itself makes an eligibility determination for a historic property.

1.3 Overview of Proposed Project Construction

The design, method of construction, and timeline of the HHCTCP continue to be refined. This overview of proposed project construction is a synopsis of the information provided in the HHCTCP FEIS (USDOT/FTA and C&C/DTS 2010).

1.3.1 Fixed Guideway and Transit Stations

The HHCTCP involves construction of a fixed guideway rail transit system that will consist primarily of elevated structures. The main components of the fixed guideway system are: the elevated guideway structure, guideway foundation columns, and transit stations. The guideway foundation columns generally consist of a single 8-foot diameter column, spaced on average, about every 120 feet, with shorter or longer spans used where needed. Transit stations generally consist of elevated platform structures with ground-level entrance buildings. The subsurface impacts associated with the fixed guideway and transit stations will be primarily associated with excavations for the guideway foundation columns and excavations associated with the construction of ground-level station buildings, including subsurface utilities, elevator shafts, etc.

Two methods will be used to construct the guideway foundations, dictated by structural demands and existing subsurface conditions. Drilled shafts are the preferred foundation excavation method, which involves: drilling with a 6- to 10-foot diameter auger to depths of 50 to 150 feet; installation of a rebar cage in the shaft; and filling the shaft with concrete. Driven-pile foundations will be constructed where lateral loads, geotechnical, or other site conditions prohibit the use of drilled shafts. Construction of driven-pile foundations involves: excavations to accommodate the pile cap; pile driving by striking the pile with a heavy weight, vibrating the pile or jacking the pile into the ground; and forming and casting the pile cap with concrete.

1.3.2 Support Facilities

Ancillary support facilities for the transit system include maintenance and storage facilities and traction power substations. These facilities will be constructed at ground-level, adjacent to the transit corridor. Subsurface impacts will include: grading of the facility locations and excavations for building foundations, subsurface utility installation or relocation, and landscaping.

1.3.3 Ancillary Impacts

Project construction will require relocation of existing utility lines within the project corridor that conflict with the proposed project design. The nature and extent of utility relocations in the study area are still being determined but, as shown in Table 1 (located on page 13), present estimates are that the vast majority of subsurface impacts will be ancillary impacts (particularly for utility relocation, roadway work and building demolition).

Guideway foundation excavations will extend below the water table, potentially creating significant need for the management of displaced water and/or drilling slurry. It is unclear at this time how wastewater and drilling slurry will be managed. De-watering pits may be excavated to temporarily collect and treat wastewater and drilling slurry prior to reuse or disposal.

Construction staging areas will be needed to provide adequate space for construction equipment, stockpiling and transfer of construction materials, parking, and other construction-

related activities. While the use of the proposed ancillary maintenance and storage facility areas and transit stations have been identified as potential staging areas, additional locations may be needed. The locations of additional construction staging areas have not yet been determined. Grading of the construction staging areas may be necessary.

1.3.4 Summary of Subsurface Impacts

While the construction of the “touch down” facilities of the three transit stations and the excavations for the column foundations for the fixed guideway may be the most obvious project-related subsurface impacts, the data available to us is that collectively, these will account for only an estimated 9.05 % of the area of project-related subsurface impacts.

The utility relocations needed for this project are quite substantial. The “dry” utilities including electric & gas line relocations are estimated to account for a third (33%) of the ground disturbance.

The “wet” utility relocations including water, sewer, and storm sewer improvements are anticipated to account for approximately 20% of the project-related subsurface impacts.

Demolition is anticipated to account for approximately 10% of project-related subsurface impacts. Existing building demolition will include excavations to remove building foundations and associated utilities and grading of the cleared land surface once demolition is done.

1.4 Environmental Setting

1.4.1 Natural Environment

The study area lies at approximately 40 foot elevation on what has come to be referred to in the archaeological literature as the Hālawa-Moanalua plain. The plain is largely formed by raised reef limestone shelf overlain by clay alluvium and colluvium eroding down from the lower slopes of the Ko‘olau volcanic range and sediments transported by air and water from various post-erosional volcanic events. Three of these post-erosional volcanic craters lie close to the HHCTCP alignment: 1) Makalapa Crater just south of Hālawa Stream and approximately 300 m to the east of the alignment along Kamehameha Highway, 2) Āliamanu Crater also just south of Hālawa Stream and approximately 1.1 km to the east of the alignment along Kamehameha Highway, and 3) Salt Lake (Āliapa‘akai) Crater approximately 800 meters to the north of the North Nimitz Highway portion of the Section 3 alignment (see Figure 1). These three volcanic events significantly displaced the lower reaches of Moanalua Stream, pushing the stream to the east. Hālawa Stream is effectively the northwest end of the present study area, entering the East Loch of Pearl Harbor approximately 250 m west of the HHCTCP alignment along Kamehameha Highway (Macdonald and Abbott 1974:374-5).

Overview of Soils

The current study area traverses (Figure 5) Mixed Fill Land (FL) as it heads south from the Hālawa Stream crossing. After approximately 500 m, the Kamehameha Highway alignment forms the effective transition zone between Mixed Fill Lands on the *makai* side and Kokokahi very stony clay, 0 to 35 percent slopes (KTKE), lands on the *mauka* side. In the vicinity of

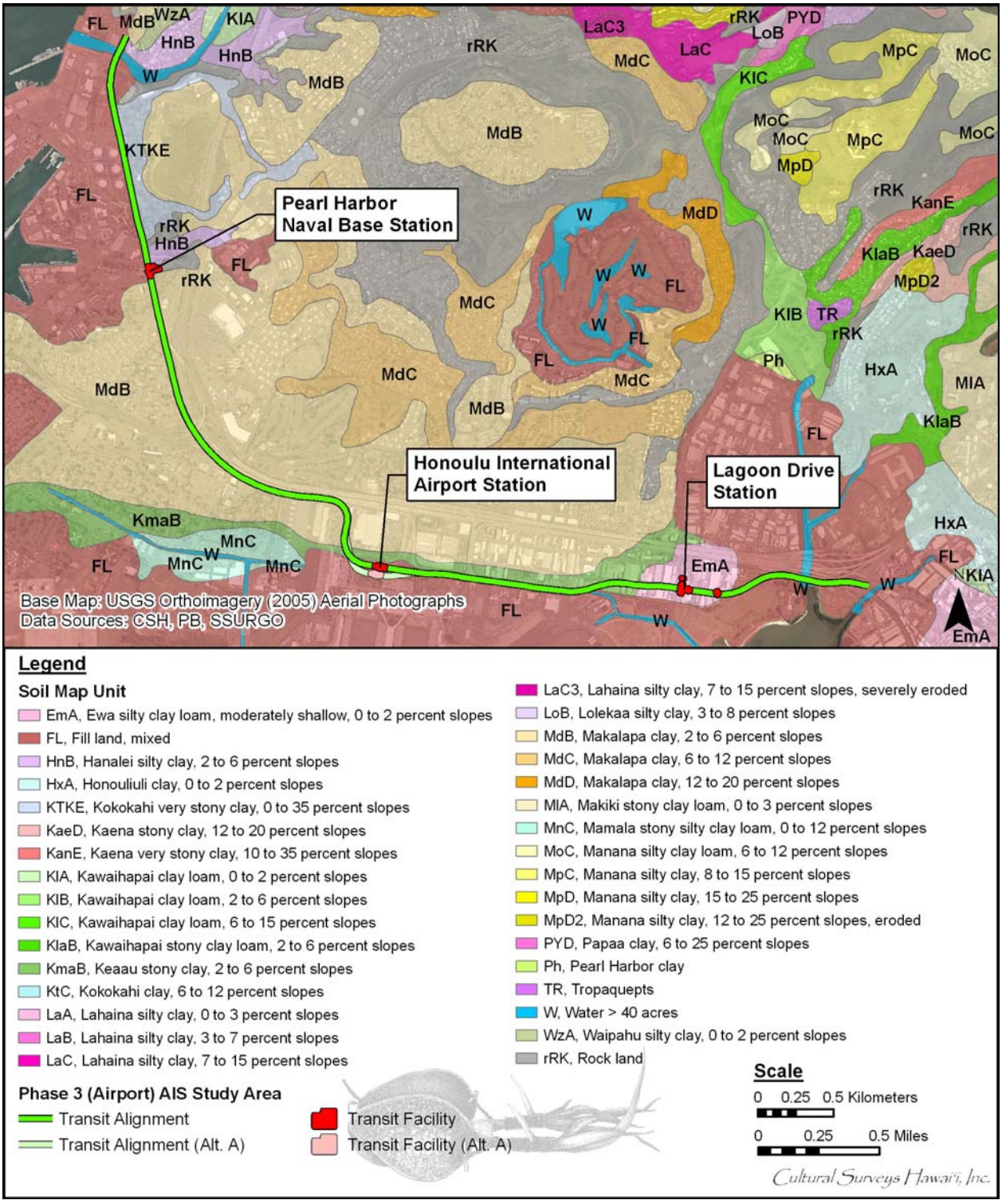

Figure 5. Soils of the study area (following Foote et al. 1972)

Radford Drive are small exposures of Rock Land (rRK) bracketing a small exposure of Hanalei silty clay, 2 to 6 percent slopes (HnB), soil. Most of the central North Nimitz Highway portion of the HHCTCP alignment traverses Makalapa clay, 6 to 12 percent slopes (MdC), soils. As the alignment heads makai and extends east along Aolele Street, it traverses Keaau stony clay, 2 to 6 percent slopes (KmaB), soils with fill land on the *makai* side. In the vicinity of Lagoon Drive are Ewa silty clay loam soils, moderately shallow, 0 to 2 percent slopes (EmA), soils. The eastern end of the study area is again Mixed Fill Land (Figure 5).

Mixed Fill Land (FL) is common near Pearl Harbor and includes “areas filled with materials dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources” (Foote et al. 1972:31).

Kokokahi very stony clay, 0 to 35 percent slopes (KTKE), consists of moderately well drained soils on talus slopes and alluvial fans developed in colluviums and alluvium derived from basic igneous rock with many stones and boulders on the surface. These soils are used for pasture and home sites (Foote et al. 1972:73).

Rock Land (rRK) is made up of areas where exposed bedrock covers more than 90 percent of the surface. This land type is not suited to farming (Foote et al. 1972:119).

Hanalei silty clay, 2 to 6 percent slopes (HnB), is typically found on stream bottoms and flood plains. Soil runoff is slow and the erosion hazard is slight. This soil is used for sugarcane, taro, and pasture (Foote et al. 1972:38).

Makalapa clay, 6 to 12 percent slopes (MdC), soil is a dark to very dark grayish-brown clay to silty clay loam understood to be derived primarily from volcanic tuff. The permeability and run-off is slow, and erosion hazard is slight, but these soils have a high shrink-swell potential. These soils are associated with urban development and pasture (Foote et al. 1972:87-88).

Keaau stony clay, 2 to 6 percent slopes (KmaB), consists of poorly drained soils on coastal plains developed in alluvium deposited over raised reef limestone or consolidated coral sand with sufficient stones to hinder machine cultivation (Foote et al. 1972:64-65).

Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes (EmA), soil develops in alluvial fans and terraces with a depth to coral limestone of 20 to 50 inches. Runoff is very slow. These lands are used for sugar cane, truck crops, and pasture (Foote et al. 1972:29-30).

Summary of Soils

In general, the soil types of the HHCTCP Airport Section 3 study area are not good agricultural soils. The small patches of Hanalei silty clay and Ewa silty clay loam are exceptionally good agricultural soils for the corridor.

More than 50% of this construction section is shown to be fill lands (Figure 5) which suggests both that extensive portions of the formal natural land surface may have been close to the water table (or under water) and that these lands have been extensively disturbed by massive grubbing, grading and fill activities.

Fresh Water

The rainfall at the Honolulu International Airport is estimated at 8.0 inches (203 mm) a year (Pacific Disaster Center 2013) which would not support non-irrigated agriculture. Except in the

immediate margins of Hālawa Stream no traditional Hawaiian agriculture would be expected in the Airport Section. It is approximately 5.25 km (as the crow flies) between the mouth of Hālawa and Moanalua streams making this a particularly dry stretch of O‘ahu’s coast. The low rainfall and distance to streams would have discouraged traditional Hawaiian and early historic habitation.

1.4.2 Built Environment

The study area is in a general vicinity of fairly intensive development of buildings, concrete and asphalt surfaces with minimal landscaping within existing developed areas.

Undeveloped areas in the vicinity away from streams are mostly in *kiawe* (*Prosopis pallida*) and *koa haole* (*Leucana glauca*) scrub.

1.4.3 Land Jurisdiction

Land jurisdiction includes federal, state, city and private lands (Table 1 and Table 2). Federal lands bounded by Radford Drive, Tarawa Drive, and Kamehameha Highway are proposed for the Pearl Harbor Naval Base Station. State lands include portions of the corridor along Kamehameha Highway, North Nimitz Highway, the H-1 Freeway, Aolele Street, and the Honolulu International Airport. City lands include portions of the corridor along Ualena Street and Waiwai Loop. Land ownership is summarized in Table 1 and 2 below:

Table 1. Land Ownership of the Section 3 Study area: Non-Right-of-Way Properties

TMK	Owner	Type	Location
9-9-003:066	KRONICK,HARRY B TRUST	Private	Kamehameha Hwy. & Kalaloa St.
9-9-002:004	UNITED STATES OF AMERICA	Federal	Kamehameha Hwy. - Hālawa Dr. to Radford Dr.
1-1-002:004	UNITED STATES OF AMERICA	Federal	Nimitz Hwy. & Main St.
1-1-003:001	STATE DOT AIRPORTS DIV	State	Airport
1-1-002:001	U S POSTAL SERVICE	Federal	Nimitz Hwy. & Aolele St.
1-1-003:011	STATE DOT AIRPORTS DIV	State	Airport
1-1-003:010	STATE DOT AIRPORTS DIV	State	Airport
1-1-003:009	STATE DOT AIRPORTS DIV	State	Airport
1-1-004:018	STATE DOT AIRPORTS DIV	State	Ualena St.
1-1-004:017	STATE DOT AIRPORTS DIV	State	Ualena St.
1-1-004:015	STATE DOT AIRPORTS DIV	State	Ualena St.
1-1-004:014	STATE DOT AIRPORTS DIV	State	Ualena St.
1-1-004:013	STATE DOT AIRPORTS DIV	State	Ualena St.
1-1-004:012	STATE DOT AIRPORTS DIV	State	Ualena St.
1-1-016:015	BREWER,JOHN V TR	Private	Waiwai Loop & Lagoon Dr.
1-1-016:014	CHEVRON U S A INC	Private	Waiwai Loop & Lagoon Dr.
1-1-016:016	INTERNATIONAL EXPRESS INC	Private	Waiwai Loop
1-1-016:013	QUEEN BEE LIMITED	Private	Waiwai Loop

TMK	Owner	Type	Location
	PARTNERSHIP		
1-1-016:017	WAIWAI LOOP RENTAL INC	Private	Waiwai Loop
1-1-016:012	WINDOW WORLD INC	Private	Waiwai Loop
1-1-016:007	WATUMULL ENTERPRISES LTD	Private	Waiwai Loop
1-1-016:006	ALERT HOLDINGS GROUP INC	Private	Waiwai Loop
1-1-016:005	2676 WAIWAI LOOP LLC	Private	Waiwai Loop
1-1-003:006	STATE DOT AIRPORTS DIV	State	Ke‘ehi Lagoon Park
1-1-003:004	STATE DOT AIRPORTS DIV	State	Ke‘ehi Lagoon Veterans Memorial
1-1-003:138	STATE OF HAWAII	State	Moanalua Stream
1-1-003:003	STATE DOT AIRPORTS DIV	State	Nimitz Hwy & Moanalua Stream

Table 2. Land Ownership of the Section 3 Study Area: Right-of-Way Properties

ROW	Owner
Kamehameha Hwy	State of Hawai‘i
H-1 Freeway	State of Hawai‘i
N Nimitz Hwy	State of Hawai‘i
Aolele St	State of Hawai‘i
Ualena St	City and County of Honolulu
Waiwai Loop	City and County of Honolulu

1.5 Introduction to Appendices

To support the discussion in this volume, an Airport Section 3 AIS companion volume includes six appendices. These appendices are referenced in the various sections of this AIS report where they supply supporting documentation. These appendices include:

Appendix A: Place Names, Wahi Pana, and a Synthesis of Data from Ethnographic/ Ethnohistoric Studies

As per the archaeological inventory survey plan for the Airport (Section 3) Construction (Hammatt and Shideler 2011) this discussion augments the cultural history (report Sections 2 and 3) overview presented in the main body of the report by drawing upon and integrating the research of four additional studies that include reviews of place names, *wahi pana* (storied places), and traditional cultural properties.

Appendix B: Land Commission Awards

In order to present a complete study a compendium of Land Commission Awards data is presented. This is drawn directly from the Hammatt and Shideler 2011 AISP Appendix A.

Appendix C: Research Design

In order to present a complete AIS study, the research design is presented. This is drawn from Section 7 of the Hammatt and Shideler 2011 AISP. While this is largely verbatim from the AISP, it does include an update on where test excavations were actually excavated in comparison to where they were initially proposed (according to the Hammatt and Shideler 2011 AISP).

Appendix D: Sample Consultation Letters and Consultation Responses

In order to present a summary of initial consultation related to the AISP preparation Appendix D includes consultation letters and response letters. This is drawn directly from Section 8 of the Hammatt and Shideler 2011 AISP.

Appendix E: GPR Method Investigation

In accordance with the Hammatt and Shideler 2011 AISP Section 7.4, a major component of the present study was to be a methods investigation of the efficacy of Ground Penetrating Radar (GPR) technology for the identification of human burial remains and other types of subsurface archaeological features. While a summary of those results are integrated in the main body of this AIS report on an excavation by excavation basis, the results are presented in detail in Appendix E.

Appendix F. Pollen Results

This is a verbatim report from Linda Scott Cummings of the PaleoResearch Institute that was the basis for the discussion of pollen results presented in Section 8.3 of the main body of this AIS report.